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1/17

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SEQUENCE LISTING

<110> Japan Science and Technology Corporation

<120> Method for Producing an Antibody with Genetic Immunization

<130> 01F033PCT

<140> PCT/JP01/06371

<141> 2001-07-24

<150> JP2000-222743

<151> 2000-07-24

<150> JP2000-254407

<151> 2000-08-24

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<170> PatentIn Ver. 2.1

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aatcaaaacg ctgattaaaa gaagcacggt atg atg acc aaa cat aaa aag tgt 174

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Gly Phe Gln Asn Lys Cys Tyr Tyr Phe Ser Lys Glu Glu Gly Asp Trp				
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aat tca agt aaa tac aac tgt tcc act caa cat gcc gac cta act ata				366
Asn Ser Ser Lys Tyr Asn Cys Ser Thr Gln His Ala Asp Leu Thr Ile				
60	65	70		
att gac aac ata gaa gaa atg aat ttt ctt agg cgg tat aaa tgc agt				414
Ile Asp Asn Ile Glu Glu Met Asn Phe Leu Arg Arg Tyr Lys Cys Ser				
75	80	85		
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Glu Gly Cys Ala Tyr Leu Ser Asp Asp Gly Ala Ala Thr Ala Arg Cys				
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Tyr Thr Glu Arg Lys Trp Ile Cys Arg Lys Arg Ile His				
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Ser Leu Cys Pro Tyr Asp Trp Ile Gly Phe Gln Asn Lys Cys Tyr Tyr  
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Tyr Leu Gln Leu Arg Asn Val Ile Glu Arg Leu Gln Glu Ala Lys His			
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Thr Val Val Pro Asp Thr Ser Arg Ile Tyr Val Ala Leu Gly Tyr Gly  
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115 120 125  
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caa ctc ctc tcc ttc atg ctc ttg gct ggg gtc ctg gtg gcc atc ctt 147  
 Gln Leu Leu Ser Phe Met Leu Leu Ala Gly Val Leu Val Ala Ile Leu  
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gtc caa gtg tcc aag gtc ccc agc tcc cta agt cag gaa caa tcc gag 195  
 Val Gln Val Ser Lys Val Pro Ser Ser Leu Ser Gln Glu Gln Ser Glu  
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caa gac gca atc tac cag aac ctg acc cag ctt aaa gct gca gtg ggt 243  
 Gln Asp Ala Ile Tyr Gln Asn Leu Thr Gln Leu Lys Ala Ala Val Gly  
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Glu Leu Ser Glu Lys Ser Lys Leu Gln Glu Ile Tyr Gln Glu Leu Thr			
75	80	85	
cag ctg aag gct gca gtg ggt gag ttg cca gag aaa tcc aag ctg cag			339
Gln Leu Lys Ala Ala Val Gly Glu Leu Pro Glu Lys Ser Lys Leu Gln			
90	95	100	105
gag atc tac cag gag ctg acc cgg ctg aag gct gca gtg ggt gag ttg			387
Glu Ile Tyr Gln Glu Leu Thr Arg Leu Lys Ala Ala Val Gly Glu Leu			
110	115	120	
cca gag aaa tcc aag ctg cag gag atc tac cag gag ctg acc cgg ctg			435
Pro Glu Lys Ser Lys Leu Gln Glu Ile Tyr Gln Glu Leu Thr Arg Leu			
125	130	135	
aag gct gca gtg ggt gag ttg cca gag aaa tcc aag ctg cag gag atc			483
Lys Ala Ala Val Gly Glu Leu Pro Glu Lys Ser Lys Leu Gln Glu Ile			
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Tyr Gln Glu Leu Thr Arg Leu Lys Ala Ala Val Gly Glu Leu Pro Glu			
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Lys Gln Gln Gln Ile Tyr Gln Glu Leu Thr Asp Leu Lys Thr Ala Phe			
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Glu Arg Leu Cys Arg His Cys Pro Lys Asp Trp Thr Phe Phe Gln Gly			
235	240	245	

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acc gcc tgc cag gaa gtg agg gcc cag ctc gtc gta atc aaa act gct	867		
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270	275	280	
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atg aag tat ctc cgg cac cgg cgg ccc aat gcc acc ctc att ctg gcc 165  
Met Lys Tyr Leu Arg His Arg Arg Pro Asn Ala Thr Leu Ile Leu Ala

1 5 10 15

atc ggc gct ttc acc ctc ctc ttc agt ctg cta gtg tca cca ccc 213  
Ile Gly Ala Phe Thr Leu Leu Leu Phe Ser Leu Leu Val Ser Pro Pro  
20 25 30acc tgc aag gtc cag gag cag cca ccg gcg atc ccc gag gcc ctg gcc 261  
Thr Cys Lys Val Gln Glu Gln Pro Pro Ala Ile Pro Glu Ala Leu Ala  
35 40 45tgg ccc act cca ccc acc cgc cca gcc ccg gcc tgc cat gcc aac 309  
Trp Pro Thr Pro Pro Thr Arg Pro Ala Pro Ala Pro Cys His Ala Asn  
50 55 60acc tct atg gtc acc cac ccg gac ttc gcc acg cag ccg cag cac gtt 357  
Thr Ser Met Val Thr His Pro Asp Phe Ala Thr Gln Pro Gln His Val  
65 70 75 80cag aac ttc ctc ctg tac aga cac tgc cgc cac ttt ccc ctg ctg cag 405  
Gln Asn Phe Leu Leu Tyr Arg His Cys Arg His Phe Pro Leu Leu Gln  
85 90 95gac gtg ccc ccc tct aag tgc gcg cag ccg gtc ttc ctg ctg ctg gtg 453  
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Ile Lys Ser Ser Pro Ser Asn Tyr Val Arg Arg Glu Leu Leu Arg Arg  
115 120 125acg tgg ggc cgc gag cgc aag gta cgg ggt ttg cag ctg cgc ctc ctc 549  
Thr Trp Gly Arg Glu Arg Lys Val Arg Gly Leu Gln Leu Arg Leu Leu  
130 135 140

ttc ctg gtg ggc aca gcc tcc aac ccg cac gag gcc cgc aag gtc aac 597

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Arg	Leu	Leu	Glu	Leu	Glu	Ala	Gln	Thr	His	Gly	Asp	Ile	Leu	Gln	Trp	
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gac	ttc	cac	gac	tcc	ttc	ttc	aac	ctc	acg	ctc	aag	cag	gtc	ctg	ttc	693
Asp	Phe	His	Asp	Ser	Phe	Phe	Asn	Leu	Thr	Leu	Lys	Gln	Val	Leu	Phe	
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Leu	Gln	Trp	Gln	Glu	Thr	Arg	Cys	Ala	Asn	Ala	Ser	Phe	Val	Leu	Asn	
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Asn	Val	Gly	Pro	Ile	Arg	Ala	Phe	Trp	Ser	Lys	Tyr	Tyr	Val	Pro	Glu	
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ttc	tt	ct	cc	cg	tt	ac	g	cc	g	cc	ct	cg	ct	g	cc	981
Phe	Leu	Leu	Ser	Arg	Phe	Thr	Ala	Ala	Ala	Leu	Arg	Arg	Ala	Ala	His	
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gtc	tt	gac	atc	tt	cc	att	gat	gat	gt	tt	ct	gg	at	tg	tg	1029
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 Met Lys Gly Trp Gly Trp Leu Ala Leu  
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 Leu His Cys Gly Ala Cys Arg Ala Leu Val Asp Glu Leu Glu Trp Glu  
 30 35 40  
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 Ile Ala Gln Val Asp Pro Lys Lys Thr Ile Gln Met Gly Ser Phe Arg  
 45 50 55  
 atc aat cca gat ggc agc cag tca gtg gtg gag gtg cct tat gcc cgc 363  
 Ile Asn Pro Asp Gly Ser Gln Ser Val Val Glu Val Pro Tyr Ala Arg  
 60 65 70  
 tca gag gcc cac ctc aca gag ctg ctg gag gag ata tgt gac cgg atg 411  
 Ser Glu Ala His Leu Thr Glu Leu Leu Glu Glu Ile Cys Asp Arg Met  
 75 80 85  
 aag gag tat ggg gaa cag att gat cct tcc acc cat cgc aag aac tac 459  
 Lys Glu Tyr Gly Glu Gln Ile Asp Pro Ser Thr His Arg Lys Asn Tyr  
 90 95 100 105  
 gta cgt gta gtg ggc cgg aat gga gaa tcc agt gaa ctg gac cta caa 507

Val Arg Val Val Gly Arg Asn Gly Glu Ser Ser Glu Leu Asp Leu Gln  
110 115 120

ggc atc cga atc gac tca gat att agc ggc acc ctc aag ttt gcg tgt 555  
Gly Ile Arg Ile Asp Ser Asp Ile Ser Gly Thr Leu Lys Phe Ala Cys  
125 130 135

gag agc att gtg gag gaa tac gag gat gaa ctc att gaa ttc ttt tcc 603  
Glu Ser Ile Val Glu Glu Tyr Glu Asp Glu Leu Ile Glu Phe Phe Ser  
140 145 150

cga gag gct gac aat gtt aaa gac aaa ctt tgc agt aag cga aca gat 651  
Arg Glu Ala Asp Asn Val Lys Asp Lys Leu Cys Ser Lys Arg Thr Asp  
155 160 165

ctt tgt gac cat gcc ctg cac ata tcg cat gag cta tga 693  
Leu Cys Asp His Ala Leu His Ile Ser His Asp Glu Leu  
170 175 180

accactggag cagccccacac tggcttgatg gatcaccccc aggaggggaa aatggtggca 753

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〈222〉 (73) . . (564)

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Met Arg Arg Leu Leu Ile Pro Leu Ala Leu Trp Leu Gly  
1 5 10

gcg gtg ggc gtg ggc gtc gcc gag ctc acg gaa gcc cag cgc cgg ggc 159  
 Ala Val Gly Val Gly Val Ala Glu Leu Thr Glu Ala Gln Arg Arg Gly  
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ctg cag gtg gcc ctg gag gaa ttt cac aag cac ccc gtg cag tgg	207
Leu Gln Val Ala Leu Glu Glu Phe His Lys His Pro Pro Val Gln Trp	
30 35 40 45	
gcc ttc cag gag acc agt gtg gag agc gcc gtg gac acg ccc ttc cca	255
Ala Phe Gln Glu Thr Ser Val Glu Ser Ala Val Asp Thr Pro Phe Pro	
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Ala Gly Ile Phe Val Arg Leu Glu Phe Lys Leu Gln Gln Thr Ser Cys	
65 70 75	
cg <sup>g</sup> aag agg gac tgg aag aaa ccc gag tgc aaa gtc agg ccc aat ggg	351
Arg Lys Arg Asp Trp Lys Lys Pro Glu Cys Lys Val Arg Pro Asn Gly	
80 85 90	
agg aaa cg <sup>g</sup> aaa tgc ctg gcc tgc atc aaa ctg ggc tct gag gac aaa	399
Arg Lys Arg Lys Cys Leu Ala Cys Ile Lys Leu Gly Ser Glu Asp Lys	
95 100 105	
gtt ctg ggc cg <sup>g</sup> ttg gtc cac tgc ccc ata gag acc caa gtt ctg cg <sup>g</sup>	447
Val Leu Gly Arg Leu Val His Cys Pro Ile Glu Thr Gln Val Leu Arg	
110 115 120 125	
gag gct gag gag cac cag gag acc cag tgc ctc agg gtg cag cg <sup>g</sup> gct	495
Glu Ala Glu Glu His Gln Glu Thr Gln Cys Leu Arg Val Gln Arg Ala	
130 135 140	
ggt gag gac ccc cac agc ttc tac ttc cct gga cag ttc gcc ttc tcc	543
Gly Glu Asp Pro His Ser Phe Tyr Phe Pro Gly Gln Phe Ala Phe Ser	
145 150 155	
aag gcc ctg ccc cgc agc taa gccagcactg agctgcgtgg tgccctccagg	594
Lys Ala Leu Pro Arg Ser	
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&lt;220&gt;

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&lt;222&gt; (105).. (1436)

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Met Arg Leu Thr  
1cg aag cgg ctc tgc tcg ttt ctt atc gcc ctg tac tgc cta ttc tcc 164  
Arg Lys Arg Leu Cys Ser Phe Leu Ile Ala Leu Tyr Cys Leu Phe Ser  
5 10 15 20ctc tac gct gcc tac cac gtc ttc ttc ggg cgc cgc cgc cag gcg ccg 212  
Leu Tyr Ala Ala Tyr His Val Phe Phe Gly Arg Arg Arg Gln Ala Pro  
25 30 35gcc ggg tcc ccc cgg ggc ctc agg aag ggg gcg gcc ccc gcg cgg gag 260  
Ala Gly Ser Pro Arg Gly Leu Arg Lys Gly Ala Ala Pro Ala Arg Glu  
40 45 50aga cgc ggc cga gaa cag tcc act ttg gaa agt gaa gaa tgg aat cct 308  
Arg Arg Gly Arg Glu Gln Ser Thr Leu Glu Ser Glu Glu Trp Asn Pro  
55 60 65tgg gaa gga gat gaa aaa aat gag caa caa cac aga ttt aaa act agc 356  
Trp Glu Gly Asp Glu Lys Asn Glu Gln Gln His Arg Phe Lys Thr Ser  
70 75 80ctt caa ata tta gat aaa tcc acg aaa gga aaa aca gat ctc agt gta 404  
Leu Gln Ile Leu Asp Lys Ser Thr Lys Gly Lys Thr Asp Leu Ser Val  
85 90 95 100caa atc tgg ggc aaa gct gcc att ggc ttg tat ctc tgg gag cat att 452  
Gln Ile Trp Gly Lys Ala Ala Ile Gly Leu Tyr Leu Trp Glu His Ile  
105 110 115ttt gaa ggc tta ctt gat ccc acg gat gtg act gct caa tgg aga gaa 500  
Phe Glu Gly Leu Leu Asp Pro Ser Asp Val Thr Ala Gln Trp Arg Glu  
120 125 130

gga aag tca atc gta gga aga aca cag tac agc ttc atc act ggt cca		548	
Gly Lys Ser Ile Val Gly Arg Thr Gln Tyr Ser Phe Ile Thr Gly Pro			
135	140	145	
gct gta ata cca ggg tac ttc tcc gtt gat gtg aat aat gtg gta ctc		596	
Ala Val Ile Pro Gly Tyr Phe Ser Val Asp Val Asn Asn Val Val Leu			
150	155	160	
att tta aat gga aga gaa aaa gca aag atc ttt tat gcc acc cag tgg		644	
Ile Leu Asn Gly Arg Glu Lys Ala Lys Ile Phe Tyr Ala Thr Gln Trp			
165	170	175	180
tta ctt tat gca caa aat tta gtg caa att caa aaa ctc cag cat ctt		692	
Leu Leu Tyr Ala Gln Asn Leu Val Gln Ile Gln Lys Leu Gln His Leu			
185	190	195	
gct gtt gtt ttg ctc gga aat gaa cat tgt gat aat gag tgg ata aac		740	
Ala Val Val Leu Leu Gly Asn Glu His Cys Asp Asn Glu Trp Ile Asn			
200	205	210	
cca ttc ctc aaa aga aat gga ggc ttc gtg gag ctg ctt ttc ata ata		788	
Pro Phe Leu Lys Arg Asn Gly Gly Phe Val Glu Leu Leu Phe Ile Ile			
215	220	225	
tat gac agc ccc tgg att aat gac gtg gat gtt ttt cag tgg cct tta		836	
Tyr Asp Ser Pro Trp Ile Asn Asp Val Asp Val Phe Gln Trp Pro Leu			
230	235	240	
gga gta gca aca tac agg aat ttt cct gtg gtg gag gca agt tgg tca		884	
Gly Val Ala Thr Tyr Arg Asn Phe Pro Val Val Glu Ala Ser Trp Ser			
245	250	255	260
atg ctg cat gat gag agg cca tat tta tgt aat ttc tta gga acg att		932	
Met Leu His Asp Glu Arg Pro Tyr Leu Cys Asn Phe Leu Gly Thr Ile			
265	270	275	
tat gaa aat tca tcc aga cag gca cta atg aac att ttg aaa aaa gat		980	
Tyr Glu Asn Ser Ser Arg Gln Ala Leu Met Asn Ile Leu Lys Lys Asp			
280	285	290	
ggg aac gat aag ctt tgt tgg gtt tca gca aga gaa cac tgg cag cct		1028	
Gly Asn Asp Lys Leu Cys Trp Val Ser Ala Arg Glu His Trp Gln Pro			
295	300	305	
cag gaa aca aat gaa agt ctt aag aat tac caa gat gcc ttg ctt cag		1076	

Gln Glu Thr Asn Glu Ser Leu Lys Asn Tyr Gln Asp Ala Leu Leu Gln	310	315	320	
agt gat ctc aca ttg tgc ccg gtc gga gta aac aca gaa tgc tat cga				1124
Ser Asp Leu Thr Leu Cys Pro Val Gly Val Asn Thr Glu Cys Tyr Arg				
325	330	335	340	
atc tat gag gct tgc tcc tat ggc tcc att cct gtg gtg gaa gac gtc				1172
Ile Tyr Glu Ala Cys Ser Tyr Gly Ser Ile Pro Val Val Glu Asp Val				
345	350	355		
atg aca gct ggc aac tgt ggg aat aca tct gtg cac cac ggt gct cct				1220
Met Thr Ala Gly Asn Cys Gly Asn Thr Ser Val His His Gly Ala Pro				
360	365	370		
ctg cag tta ctc aag tcc atg ggt gct ccc ttt atc ttt atc aag aac				1268
Leu Gln Leu Leu Lys Ser Met Gly Ala Pro Phe Ile Phe Ile Lys Asn				
375	380	385		
tgg aag gaa ctc cct gct gtt tta gaa aaa gag aaa act ata att tta				1316
Trp Lys Glu Leu Pro Ala Val Leu Glu Lys Glu Lys Thr Ile Ile Leu				
390	395	400		
caa gaa aaa att gaa aga aga aaa atg tta ctt cag tgg tat cag cac				1364
Gln Glu Lys Ile Glu Arg Arg Lys Met Leu Leu Gln Trp Tyr Gln His				
405	410	415	420	
ttc aag aca gag ctt aaa atg aaa ttt act aat att tta gaa agc tca				1412
Phe Lys Thr Glu Leu Lys Met Lys Phe Thr Asn Ile Leu Glu Ser Ser				
425	430	435		
ttt tta atg aat aat aaa agt taa ttatctttt gagct				1451
Phe Leu Met Asn Asn Lys Ser				
440				